

FORM PTO-1390 (REV 5-93)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER <b>951/50010</b>	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371					
INTERNATIONAL APPLICATION NO. PCT/EP00/01766			INTERNATIONAL FILING DATE 1 March 2000		PRIORITY DATE CLAIMED 19 March 1999
TITLE OF INVENTION DEVICE AND METHOD FOR INCREASING THE SECURITY OF A VEHICLE					
APPLICANT(S) FOR DO/EO/US Rudolf EHRMAIER and Josef NEUNER					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
1.	<input checked="" type="checkbox"/>	This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.			
2.		This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371			
3.	<input checked="" type="checkbox"/>	This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay Examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).			
4.	<input checked="" type="checkbox"/>	A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.			
5.	<input checked="" type="checkbox"/>	A copy of the International Application as filed (35 U.S.C. 371(c)(2)).			
		a.		is transmitted herewith (required only if not transmitted by the International Bureau).	
		b.	<input checked="" type="checkbox"/>	has been transmitted by the International Bureau	
		c.		is not required, as the application was filed in the United States Receiving Office (RO/US)	
6.	<input checked="" type="checkbox"/>	A translation of the International Application into English (35 U.S.C. 371(c)(2)).			
7.	<input checked="" type="checkbox"/>	Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))			
		a.		are transmitted herewith (required only if not transmitted by the International Bureau).	
		b.		have been transmitted by the International Bureau.	
		c.		have not been made; however, the time limit for making such amendments has NOT expired.	
		d.	<input checked="" type="checkbox"/>	have not been made and will not be made.	
8.		A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).			
9.	<input checked="" type="checkbox"/>	An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) (unexecuted)			
10.	<input checked="" type="checkbox"/>	A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).			
<b>Item 11. to 16. below concern other document(s) or information included:</b>					
11.	<input checked="" type="checkbox"/>	An Information Disclosure Statement under 37 CFR 1.97 and 1.98.			
12.		An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.			
13.	<input checked="" type="checkbox"/>	A FIRST preliminary amendment.			
		A SECOND or SUBSEQUENT preliminary amendment.			
14.	<input checked="" type="checkbox"/>	A substitute specification and marked-up copy thereof.			
15.		A change of power of attorney and/or address letter.			
16.	<input checked="" type="checkbox"/>	Other items or information:			
		a. Form PCT/IB/308;			
		b. 1 sheet of drawings showing Figs. 1-2;			
		c. International Preliminary Examination Report w/Annexes; and			
		d. International Search Report.			



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PATENT TRADEMARK OFFICE

U.S. APPLICATION NO (if known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO		ATTORNEY'S DOCKET NUMBER	
09/936905		PCT/EP00/01766		951/50010	
17. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)):					
Search Report has been prepared by the EPO or JPO \$ 860.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482) \$ 690.00					
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$ 710.00					
Neither international preliminary examination fee (37 CFR 1.482) nor International search fee (37 CFR 1.445(a)(2)) paid to USPTO \$ 1000.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$ 100.00					
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$ 860.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$130.00	
Claims	Number Filed	Number Extra	Rate		
Total Claims	21 - 20 =	1	X \$18.00	\$18.00	
Independent Claims	2 - 3 =	0	X \$80.00	\$	
Multiple dependent claims(s) (if applicable)			+ \$270.00	\$	
TOTAL OF ABOVE CALCULATIONS=				\$1008.00	
Applicant claims Small Entity Status (See 37 CFR §1.27) <input type="checkbox"/> yes <input type="checkbox"/> no. Reduction by 1/2 for filing by small entity, if applicable.				\$	
SUBTOTAL =				\$1008.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$1008.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28,3.31). \$40.00 per property +				\$	
TOTAL FEE ENCLOSED =				\$1008.00	
				Amount to be: refunded \$	
				Charged \$	
a. <input checked="" type="checkbox"/> A check in the amount of \$1008.00 for the filing fee is enclosed					
b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.					
c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees, which may be required, or credit any overpayment to Deposit Account No. 05-1323. A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:					
Crowell & Moring, L.L.P.			SIGNATURE		
P.O. Box 14300			Jeffrey D. Sanok		
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Fax No. (202) 628-8844			REGISTRATION NUMBER		
			September 19, 2001		
			DATE		

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Attorney Docket: 951/50010  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: RUDOLF EHRMAIER ET AL.

Serial No.: NOT YET ASSIGNED PCT NO.: PCT/EP00/01766

Filed: CONCURRENTLY HERewith

Title: DEVICE AND METHOD FOR INCREASING THE SECURITY  
OF A VEHICLE

PRELIMINARY AMENDMENT

Box PCT

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Please enter the following amendments to the specification and claims, as amended by way of Annexes to the International Preliminary Examination Report for PCT/EP00/01766, prior to the examination of the application during the U.S. National Phase.

IN THE SPECIFICATION:

Submitted herewith is a substitute specification and marked-up copy thereof which includes the changes made by way of the Annexes to the International Preliminary Examination Report.

**IN THE CLAIMS:**

Please cancel claims 1-11 presently in the application and substitute new claims 12-32 as follows:

12. (New) A device for increasing security of a motor vehicle, comprising:

an automatic transmission;

an electric transmission control operatively coupled with the automatic transmission;

a detection device that detects one of an accident and swerving event of the vehicle and generates a corresponding signal;

an analyzing device that evaluates whether the signal reaches a specific value or exceeds a specific threshold, said analyzing device causing the electric transmission control to interrupt a positive engagement of the automatic transmission when the specific value is reached or the specific threshold is exceeded.

13. (New) The device according to claim 12, wherein the detection device is part of an air bag triggering device, said analyzing device causing the interruption of the positive engagement when a triggering of an air bag or a signal that leads to the triggering of the air bag is detected.

14. (New) The device according to claim 13, wherein the part of the air bag triggering device comprises at least one of a crash sensor and an air bag control unit that provides signals used for triggering the air bag.

15. (New) The device according to claim 12, wherein the detection device is a rollover sensor, the positive engagement being interrupted when a rollover event is detected.

16. (New) The device according to claim 13, wherein the detection device also includes a rollover sensor, the positive engagement being interrupted when a rollover event is detected.

17. (New) The device according to claim 14, wherein the detection device also includes a rollover sensor, the positive engagement being interrupted when a rollover event is detected.

18. (New) The device according to claim 13, further comprising an automatic parking position system, said automatic parking position system being activated when the positive engagement of the transmission is interrupted.

19. (New) The device according to claim 14, further comprising an automatic parking position system, said automatic parking position system being activated when the positive engagement of the transmission is interrupted.

20. (New) The device according to claim 15, further comprising an automatic parking position system, said automatic parking position system being activated when the positive engagement of the transmission is interrupted.

21. (New) The device according to claim 18, further comprising a vehicle speed sensor, said automatic parking position system being activated when, in addition to the interruption of the positive engagement, the vehicle speed is substantially zero.

22. (New) The device according to claim 12, wherein the detection device generates a value describing the swerving event, said analyzing device causing the interruption of the positive engagement of the transmission when the swerving event value exceeds a specific threshold value.

23. (New) The device according to claim 22, wherein the electric transmission control shifts the automatic transmission into a neutral position in an event of the interruption of the positive engagement.

24. (New) The device according to claim 22, wherein the detection device includes at least one of rotational wheel speed sensors and a yaw rate sensor.

25. (New) The device according to claim 23, wherein the detection device includes at least one of rotational wheel speed sensors and a yaw rate sensor.

26. (New) The device according to claim 12, wherein said analyzing device is integrated into the electric transmission control.

27. (New) The device according to claim 12, further comprising a gear selection device having a defined rest position, said gear selection device being directed out of the rest position in order to select a driving position desired by the driver and then being automatically returned.

28. (New) A method for increasing security of a vehicle having an automatic transmission operatively coupled with an electric transmission control, the method comprising the acts of:

detecting one of an accident and a swerving event of the vehicle;

generating a signal value associated with the accident or swerving event;

evaluating the signal value to determine whether it reaches a specific value or exceeds a specific threshold; and

interrupting the positive engagement of the automatic transmission when the specific value is reached or the specific threshold is exceeded.

29. (New) The method according to claim 28, wherein the act of detecting the accident is carried out by determining whether an air bag is triggered or whether a signal leading to the triggering of the air bag is detected.

30. (New) The method according to claim 28, wherein the act of detecting the swerving event is carried out by analyzing signals from at least one of rotational wheel speed sensors and a yaw rate sensor of the vehicle.

31. (New) The method according to claim 29, further comprising the act of activating an automatic parking position system when the positive engagement of the transmission is interrupted.

32. (New) The method according to claim 30, further comprising the act of shifting the automatic transmission into a neutral position when the positive engagement of the transmission is interrupted.

**IN THE ABSTRACT:**

Please add an Abstract of the Disclosure submitted herewith on a separate page.



REMARKS

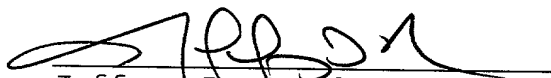
Entry of the amendments to the specification and claims, as amended by way of Annexes to the International Preliminary Examination Report for PCT/EP00/01766, before examination of the application in the U.S. National Phase is respectfully requested.

If there are any questions regarding this Preliminary Amendment or this application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #951/50010).

Respectfully submitted,

September 19, 2001

  
Jeffrey D. Sanok  
Registration No. 32,169

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--ABSTRACT OF THE DISCLOSURE

The invention relates to a device for increasing the security of a motor vehicle comprising an automatic transmission, which is impinged upon by an electrical transmission control system and a detection unit for detecting a critical driving situation and for generating a corresponding signal. In order to increase driving security, an evaluation device is provided which checks whether the generated signal has reached a specific value or exceeded a specific threshold. If said value has been reached or the threshold has been exceeded, the evaluation device causes the transmission control system to interrupt the positive engagement of the transmission.--

Attorney Docket: 951/50010  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: RUDOLF EHRMAIER ET AL.

Serial No.: NOT YET ASSIGNED PCT NO.: PCT/EP00/01766

Filed: SEPTEMBER 19, 2001

Title: DEVICE AND METHOD FOR INCREASING THE SECURITY OF A  
VEHICLE

SUBMISSION OF SUBSTITUTE SPECIFICATION

**Box PCT**


Commissioner for Patents  
Washington, D.C. 20231

Sir:

Attached is a Substitute Specification and a marked-up copy of the original specification. I certify that said substitute specification contains no new matter and includes the changes indicated in the marked-up copy of the original specification.

Respectfully submitted,

September 19, 2001

  
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JDS:pct

Attorney Docket No. 951/50010  
Clean Copy of Substitute Specification

DEVICE AND METHOD FOR INCREASING THE SECURITY OF A VEHICLE

BACKGROUND AND SUMMARY OF THE INVENTION

[0001] The invention relates to a device for increasing the security of a vehicle, and, more particularly, to a device for increasing the security of a vehicle having an automatic transmission, which is acted upon by an electric transmission control and a detection device for detecting a critical driving situation and generating a corresponding signal.

[0002] If it is determined that vehicle security is at risk, measures should generally be taken for continuously ensuring the vehicle security. In the following, a differentiation will be made between two groups of situations with respect to the vehicle security.

[0003] On the one hand, vehicle security may relate to a stable vehicle handling. Many methods and systems for improving the directional control are known.

[0004] For example, from German patent document DE 196 35 809 A1, a method and a system are known for improving directional control in the coasting operation, in which the transmission line is interrupted by disengaging a friction clutch when the difference of the rotational wheel speeds between the driven and non-driven wheels exceeds a certain

threshold value. As a result, the directional control is increased in the coasting operation.

[0005] From German patent document DE 35 28 389 A1, a corresponding system is known for a wheel slip control.

[0006] U.S. patent document US 5,362,287 describes a control method for an automatic clutch in the case of which the transmission line is interrupted when an excessive wheel slip is detected, the wheel slip being the result of an engine braking.

[0007] In the case of automatic transmissions, it is also recommended that, when the vehicle handling is unstable or during a swerving event, the "neutral" transmission position be engaged manually in order to more rapidly return the vehicle into a stable condition. However, very few drivers are capable of removing a hand from the steering wheel during a swerving event and moving the gear selector lever to the N position.

[0008] Another group of situations is represented by driving situations in the sense of accident situations. In accident situations, it is generally provided that, for safety

reasons, a vehicle is to be stopped after an accident and any further vehicle movement is to be avoided.

[0009] For solving this problem various measures are known. For example, it is possible to interrupt the ignition or the fuel supply after an air bag is triggered, which may be used as an indicator with respect to an accident. The engine is then switched off after a corresponding event. However, it is also possible to interrupt the vehicle movement in a time-delayed manner. Furthermore, there is the risk that a disturbance exists in the engine timing unit and/or there is an interference in the signal transmission from the air bag control unit to the engine timing unit.

[0010] Furthermore, an air bag control unit is known from Japanese patent document JP 10103498, which provides a signal to a transmission control when an air bag is triggered. When the air bag is triggered, the transmission control shifts the transmission into a state with a low torque output.

[0011] It is an object of the present invention to further develop a system of the above-mentioned type for increasing the security in the case of a vehicle in order to ensure the vehicle safety in every case also during accidents and swerving events.

[0012] This object is achieved by a device for increasing the security of a vehicle having an automatic transmission, which is acted upon by an electric transmission control, and a detection device for detecting an accident or a swerving event and generating a corresponding signal. An analyzing device is provided to examine whether the generated signal reaches a certain value or exceeds a certain threshold. When the value is reached or the threshold is exceeded, the analyzing device causes the transmission control to interrupt the positive engagement of the transmission.

[0013] An essential idea of certain preferred embodiments of the present invention is the fact that the positive engagement in the transmission will be interrupted when a detection unit determines an accident or a swerving situation.

[0014] According to a first embodiment of the invention, the positive engagement in the automatic transmission will be interrupted by the electric transmission control in the event swerving starting at a defined swerving intensity. In a preferred embodiment, the transmission will then be shifted into the neutral position. In this manner, it is possible to interrupt the positive engagement in the transmission line independently and in the required manner in order to ensure high directional control of the vehicle.





engagement is interrupted because of the air bag triggering operation or the rollover event. In this context, reference is also made to German patent document DE 196 25 019 A1 in which, among other things, an automatic activating of the parking position is described. By activating the parking position, rolling-away is effectively prevented after a stoppage of the vehicle.

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[0017] According to another preferred embodiment, a transmission selection device is provided which has a defined rest position and, for selecting a driving position desired by the driver, can be directed out of its rest position into which it will then automatically return. When the positive engagement is interrupted or a shifting into the neutral position takes place on the part of the transmission, the driver will not be confused by different adjustments of the transmission selection device, on the one hand, and of the transmission, on the other hand. Also, no synchronization problems occur as a result of absent detent positions.

[0018] Additional embodiments are defined in the subclaims.

[0019] Two simple embodiments of the present invention will be explained in detail with respect to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Figure 1 is a schematic block diagram of a device for increasing the directional control according to the invention; and

[0021] Figure 2 is a schematic block diagram of a second embodiment of the device according to the invention for increasing the security.

DETAILED DESCRIPTION OF THE DRAWINGS

[0022] According to Figure 1, an internal-combustion engine 12, which is coupled directly with a transmission 10, is arranged in a vehicle which is not shown. An output shaft 14 extends from the transmission 10 in the direction of the wheels which are not shown.

[0023] The transmission is an automatic range transmission which is shifted by means of an electric transmission control 16. The transmission control 16 receives its input information from a bus 18 (such as a CAN bus). It has an interface which is not described in detail and which is coupled with the bus 18 (reference number 20) and which filters the required information out of the information present on the bus.

[0024] In the first embodiment, information concerning rotational wheel speeds  $N_1$  to  $N_4$  is present on the bus 20, which is fed into the bus 18 by corresponding rotational wheel speed sensors 22 to 28. In addition, information concerning the yaw rate  $G$  is present on the bus 20, which yaw rate  $G$  is fed by a yaw sensor 30.

[0025] The electric transmission control 16 continuously determines a swerve value from the signals  $N_1$  to  $N_4$  and  $G$  and compares this swerve value with a limit value stored in the transmission control 16. If the swerve value exceeds the defined limit value, the transmission 10 shifts into its neutral position whereby the positive engagement in the transmission line is interrupted.

[0026] As an alternative, the signals of other sensors or detection devices which permit a conclusion with respect to a swerving event can naturally also be analyzed.

[0027] In certain critical situations in which an interruption of the transmission line is helpful, the driver must therefore no longer manually shift the transmission into the neutral position. On the contrary, this is carried out by the vehicle itself.

[0028] An alternative embodiment of the invention is illustrated in Figure 2. In this case, an internal-combustion engine 112 is arranged in a vehicle, which is also not shown. This internal-combustion engine 112 is again directly coupled with a transmission 110. An output shaft 114 extends from the transmission 110 in the direction of the wheels which are not shown.

[0029] The transmission 114 is an automatic range transmission which is shifted by means of an electric transmission control 116. The transmission control 116 receives its input information from a bus 118. The transmission control 116 has an interface 120 which is not described in detail and which is coupled with the bus 118 and filters the required information out of the information present on the bus 118.

[0030] In a second embodiment, information concerning air bag triggering events, specifically signals  $AN_1$  to  $AN_4$ , are present on the bus 120. These signals are fed by corresponding air bag triggering devices 122 to 128, for example, crash sensors or an air bag control unit, into the bus 118. Furthermore, information concerning a rollover event  $\ddot{U}$  is present on the bus 120, which information is fed by a rollover sensor 130.

[0031] The electric transmission control 116 now continuously monitors the existing air bag triggering and rollover signals. When a triggering of an air bag or a rollover event is detected, the transmission 110 is shifted such that its positive engagement is interrupted. Thus, no more torque is transmitted from the engine 112 to the driving wheels and a continued movement of the vehicle is effectively prevented.

[0032] As an alternative, naturally the signals of other sensors or detection devices can also be analyzed, from which a conclusion can then be drawn with respect to a situation in which the positive engagement in the transmission should be interrupted.

[0033] In critical situations in which an interruption of the positive engagement in the transmission line or in the transmission is helpful, the driver therefore no longer has to manually shift the transmission into the neutral position. On the contrary, the vehicle itself achieves an interruption of the transmission line and, as a further development, a locking of the wheels.

[0034] Since the above-mentioned applications can be implemented by a corresponding modification of the

- 11 -

Attorney Docket No. 951/50010  
Marked Up Substitute Specification

[DEVICE FOR INCREASING THE SECURITY OF A VEHICLE]

[Specification]

[The invention relates to a device for increasing the security of a vehicle, according to the preamble of Claim 1.

If it is determined that the vehicle security is at risk, measures should generally be taken for a continuous ensuring of the vehicle security. In the following, a differentiation will be made between two groups of situations with respect to the vehicle security.

On the one hand, vehicle security may relate to a stable vehicle handling. Many methods and systems for improving the directional control are known.

For example, from German Patent Document DE 196 35 809 A1, a method and a system are known for improving the directional control in the coasting operation, in which the transmission line is interrupted by disengaging a friction clutch when the difference of the rotational wheel speeds between the driven and non-driven wheels exceeds a certain threshold value. As a result, the directional control is increased in the coasting operation.

From German Patent Document DE 35 28 389 A1, a corresponding system is known for a wheel slip control.

In the case of automatic transmissions, it is also recommended that, when the vehicle handling is unstable or during a swerving event, the "neutral" transmission position be engaged manually in order to more rapidly return the vehicle into a stable condition. However, very few drivers are capable of removing a hand from the steering wheel during a swerving event and moving the gear selector lever to the N position.

Another group is represented by driving situations in the sense of accident situations. In accident situations, it is generally provided that, for safety reasons, a vehicle is to be stopped after an accident and any further vehicle movement is to be avoided.

Various measures are known for solving this problem. For example, it is possible to interrupt the ignition or the fuel supply after a triggering of an air bag which may be used as an indicator with respect to an accident. The engine is then switched off after a corresponding event. However, it is also possible that a vehicle movement is interrupted in a time-delayed manner. Furthermore, there is the risk that a disturbance exists in the engine timing unit and/or there is an interference in the



signal transmission from the air bag control unit to the engine timing unit.

Furthermore, an air bag control unit is known from Japanese Patent Document JP 10103498, which provides a signal to a transmission control when an air bag is triggered. When the air bag is triggered, the transmission control shifts the transmission into a state with a low torque output.

It is an object of the present invention to further develop a system of the initially mentioned type for increasing the security in the case of a vehicle in order to ensure the vehicle safety in every case also in critical driving situations.

This object is achieved by means of the characteristics indicated in Claim 1.

An essential idea of the present invention is the fact that the positive engagement in the transmission will be interrupted when a detection unit determines a critical driving situation.

According to a first embodiment of the invention, the positive engagement in the automatic transmission will be interrupted by the electric transmission control in the event of a swerving starting at a defined swerving intensity. In a

preferred embodiment, the transmission will then be shifted into the neutral position. In this manner, it is possible to interrupt the positive engagement in the transmission line independently and in the required manner in order to ensure a high directional control.

According to an alternative embodiment of the invention, the transmission is controlled by the electric transmission control in the event of a triggering of an air bag and/or a rollover event such that the positive engagement in the transmission is interrupted. As a result, it is ensured that a continued movement of the vehicle will be prevented even if the engine continues to run. In this case, the triggering of an air bag or the rollover event are used as an indication of the occurrence of an accident. A conclusion can be drawn with respect to the triggering of an air bag either by way of a monitoring of a crash sensor directly or by way of the reaction of an air bag control unit. In this sense, a triggering of an air bag is assumed even when signals are detected which lead to a triggering of an air bag.]

DEVICE AND METHOD FOR INCREASING THE SECURITY OF A VEHICLE

BACKGROUND AND SUMMARY OF THE INVENTION

The invention relates to a device for increasing the security of a vehicle, and, more particularly, to a device for increasing the security of a vehicle having an automatic transmission, which is acted upon by an electric transmission control and a detection device for detecting a critical driving situation and generating a corresponding signal.

If it is determined that vehicle security is at risk, measures should generally be taken for continuously ensuring the vehicle security. In the following, a differentiation will be made between two groups of situations with respect to the vehicle security.

On the one hand, vehicle security may relate to a stable vehicle handling. Many methods and systems for improving the directional control are known.

For example, from German patent document DE 196 35 809 A1, a method and a system are known for improving directional control in the coasting operation, in which the transmission line is interrupted by disengaging a friction clutch when the difference of the rotational wheel speeds between the driven and non-driven wheels exceeds a certain threshold value. As a result, the directional control is increased in the coasting operation.

From German patent document DE 35 28 389 A1, a corresponding system is known for a wheel slip control.

U.S. patent document US 5,362,287 describes a control method for an automatic clutch in the case of which the transmission line is interrupted when an excessive wheel slip is detected, the wheel slip being the result of an engine braking.

In the case of automatic transmissions, it is also recommended that, when the vehicle handling is unstable or during a swerving event, the "neutral" transmission position be engaged manually in order to more rapidly return the vehicle into a stable condition. However, very few drivers are capable of removing a hand from the steering wheel during a swerving event and moving the gear selector lever to the N position.

Another group of situations is represented by driving situations in the sense of accident situations. In accident situations, it is generally provided that, for safety reasons, a vehicle is to be stopped after an accident and any further vehicle movement is to be avoided.

For solving this problem various measures are known. For example, it is possible to interrupt the ignition or the fuel supply after an air bag is triggered, which may be used as an

indicator with respect to an accident. The engine is then switched off after a corresponding event. However, it is also possible to interrupt the vehicle movement in a time-delayed manner. Furthermore, there is the risk that a disturbance exists in the engine timing unit and/or there is an interference in the signal transmission from the air bag control unit to the engine timing unit.

Furthermore, an air bag control unit is known from Japanese patent document JP 10103498, which provides a signal to a transmission control when an air bag is triggered. When the air bag is triggered, the transmission control shifts the transmission into a state with a low torque output.

It is an object of the present invention to further develop a system of the above-mentioned type for increasing the security in the case of a vehicle in order to ensure the vehicle safety in every case also during accidents and swerving events.

This object is achieved by a device for increasing the security of a vehicle having an automatic transmission, which is acted upon by an electric transmission control, and a detection device for detecting an accident or a swerving event and generating a corresponding signal. An analyzing device is provided to examine whether the generated signal reaches a

certain value or exceeds a certain threshold. When the value is reached or the threshold is exceeded, the analyzing device causes the transmission control to interrupt the positive engagement of the transmission.

An essential idea of certain preferred embodiments of the present invention is the fact that the positive engagement in the transmission will be interrupted when a detection unit determines an accident or a swerving situation.

According to a first embodiment of the invention, the positive engagement in the automatic transmission will be interrupted by the electric transmission control in the event swerving starting at a defined swerving intensity. In a preferred embodiment, the transmission will then be shifted into the neutral position. In this manner, it is possible to interrupt the positive engagement in the transmission line independently and in the required manner in order to ensure high directional control of the vehicle.

According to an alternative embodiment of the invention, the transmission is controlled by the electric transmission control in the event of a triggering of an air bag and/or a rollover event such that the positive engagement in the transmission is interrupted. As a result, it is ensured that continued movement

of the vehicle will be prevented even if the engine continues to run. In this case, the triggering of an air bag or the rollover event are used as an indication of the occurrence of an accident. A conclusion can be drawn with respect to the triggering of an air bag either by way of monitoring a crash sensor directly or by way of the reaction of an air bag control unit. In this sense, a triggering of an air bag is assumed even when signals are detected which lead to a triggering of an air bag.

In the above context, an embodiment [is] of special interest is in the case [of which] wherein an automatically operable parking position is provided, which is also addressed by a control unit and which will be engaged when the vehicle has come to a stop after an air bag triggering operation and/or a rollover event. For indicating and including the vehicle speed, a normally existing vehicle speed sensor can be analyzed. Naturally, the parking position can also be engaged on the basis of other criteria. Furthermore, it is possible to immediately engage the parking position when the positive engagement is interrupted because of the air bag triggering operation or the rollover event. In this context, reference is also made to German [Patent Document] patent document DE 196 25 019 A1 in which, among other things, an automatic activating of the parking position is described. By activating the parking position, [a]

rolling-away is effectively prevented after a stoppage of the vehicle.

According to another preferred embodiment, a transmission selection device is provided which has a defined rest position and, for selecting a driving position desired by the driver, can be directed out of its rest position into which it will then automatically return. When the positive engagement is interrupted or a shifting into the neutral position takes place on the part of the transmission, the driver will not be confused by different adjustments of the transmission selection device, on the one hand, and of the transmission, on the other hand. Also, no synchronization problems occur as a result of absent detent positions.

Additional embodiments are defined in the subclaims.

Two simple embodiments of the present invention will be explained in detail with respect to the attached drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic block diagram of a device for increasing the directional control according to the invention; and



Figure 2 is a schematic block diagram of a second embodiment of the device according to the invention for increasing the security.

DETAILED DESCRIPTION OF THE DRAWINGS

According to Figure 1, an internal-combustion engine 12, which is coupled directly with a transmission 10, is arranged in a vehicle which is not shown. An output shaft 14 extends from the transmission 10 in the direction of the wheels which are not shown.

The transmission is an automatic range transmission which is shifted by means of an electric transmission control 16. The transmission control 16 receives its input information from a bus 18 (such as a CAN bus). It has an interface which is not described in detail and which is coupled with the bus 18 (reference number 20) and which filters the required information out of the information present on the bus.

In the first embodiment, information concerning rotational wheel speeds  $N_1$  to  $N_4$  is present on the bus 20, which is fed into the bus 18 by corresponding rotational wheel speed sensors 22 to 28. In addition, information concerning the yaw rate  $G$  is present on the bus 20, which yaw rate  $G$  is fed by a yaw sensor 30.

The electric transmission control 16 continuously determines a swerve value from the signals  $N_1$  to  $N_4$  and G and compares [it with] this swerve value with a limit value stored in the transmission control 16. If the swerve value exceeds the defined limit value, the transmission 10 shifts into its neutral position whereby the positive engagement in the transmission line is interrupted.

As an alternative, the signals of other sensors or detection devices which permit a conclusion with respect to a swerving event can naturally also be analyzed.

In certain critical situations in which an interruption of the transmission line is helpful, the driver must therefore no longer manually shift the transmission into the neutral position. On the contrary, this is carried out by the vehicle itself.

An alternative embodiment of the invention is illustrated in Figure 2. In this case, an internal-combustion engine 112 is arranged in a vehicle, which is also not shown. This internal-combustion engine 112 is again directly coupled with a transmission 110. An output shaft 114 extends from the transmission 110 in the direction of the wheels which are not shown.

The transmission 114 is an automatic range transmission which is shifted by means of an electric transmission control 116. The transmission control 116 receives its input information from a bus 118. The transmission control 116 has an interface 120 which is not described in detail and which is coupled with the bus 118 [(reference number 120)] and filters the required information out of the information present on the bus 118.

In a second embodiment, information concerning air bag triggering events, specifically signals  $AN_1$  to  $AN_4$ , are present on the bus 120. These signals are fed by corresponding air bag triggering devices 122 to 128, for example, crash sensors or an air bag control unit, into the bus 118. Furthermore, information concerning a rollover event  $\ddot{U}$  is present on the bus 120, which information is fed by a rollover sensor 130.

The electric transmission control 116 now continuously monitors the existing air bag triggering and rollover signals. When a triggering of an air bag or a rollover event is detected, the transmission 110 [shifts] is shifted such that [the] its positive engagement [in it] is interrupted. Thus, no more torque is transmitted from the engine 112 to the driving wheels and a continued movement of the vehicle is effectively prevented.

As an alternative, naturally the signals of other sensors or detection devices can also be analyzed, from which a conclusion can then be drawn with respect to a situation in which the positive engagement in the transmission should be interrupted.

In critical situations in which an interruption of the positive engagement in the transmission line or in the transmission is helpful, the driver therefore no longer has to manually shift the transmission into the neutral position. On the contrary, the vehicle itself achieves an interruption of the transmission line and, as a further development, a locking of the wheels.

Since the above-mentioned applications can be implemented by a corresponding modification of the transmission software, a particularly cost-effective implementation is possible.

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DEVICE FOR INCREASING THE SECURITY OF A VEHICLE

Specification

The invention relates to a device for increasing the security of a vehicle, according to the preamble of Claim 1.

If it is determined that the vehicle security is at risk, measures should generally be taken for a continuous ensuring of the vehicle security. In the following, a differentiation will be made between two groups of situations with respect to the vehicle security.

On the one hand, vehicle security may relate to a stable vehicle handling. Many methods and systems for improving the directional control are known.

For example, from German Patent Document DE 196 35 809 A1, a method and a system are known for improving the directional control in the coasting operation, in which the transmission line is interrupted by disengaging a friction clutch when the difference of the rotational wheel speeds between the driven and non-driven wheels exceeds a certain threshold value. As a result, the directional control is increased in the coasting

operation.

From German Patent Document DE 35 28 389 A1, a corresponding system is known for a wheel slip control.

In the case of automatic transmissions, it is also recommended that, when the vehicle handling is unstable or during a swerving event, the "neutral" transmission position be engaged manually in order to more rapidly return the vehicle into a stable condition. However, very few drivers are capable of removing a hand from the steering wheel during a swerving event and moving the gear selector lever to the N position.

Another group is represented by driving situations in the sense of accident situations. In accident situations, it is generally provided that, for safety reasons, a vehicle is to be stopped after an accident and any further vehicle movement is to be avoided.

Various measures are known for solving this problem. For example, it is possible to interrupt the ignition or the fuel supply after a triggering of an air bag which may be used as an indicator with respect to an accident. The engine is then

switched off after a corresponding event. However, it is also possible that a vehicle movement is interrupted in a time-delayed manner. Furthermore, there is the risk that a disturbance exists in the engine timing unit and/or there is an interference in the signal transmission from the air bag control unit to the engine timing unit.

Furthermore, an air bag control unit is known from Japanese Patent Document JP 10103498, which provides a signal to a transmission control when an air bag is triggered. When the air bag is triggered, the transmission control shifts the transmission into a state with a low torque output.

It is an object of the present invention to further develop a system of the initially mentioned type for increasing the security in the case of a vehicle in order to ensure the vehicle safety in every case also in critical driving situations.

This object is achieved by means of the characteristics indicated in Claim 1.

An essential idea of the present invention is the fact that the positive engagement in the transmission will be interrupted

when a detection unit determines a critical driving situation.

According to a first embodiment of the invention, the positive engagement in the automatic transmission will be interrupted by the electric transmission control in the event of a swerving starting at a defined swerving intensity. In a preferred embodiment, the transmission will then be shifted into the neutral position. In this manner, it is possible to interrupt the positive engagement in the transmission line independently and in the required manner in order to ensure a high directional control.

According to an alternative embodiment of the invention, the transmission is controlled by the electric transmission control in the event of a triggering of an air bag and/or a rollover event such that the positive engagement in the transmission is interrupted. As a result, it is ensured that a continued movement of the vehicle will be prevented even if the engine continues to run. In this case, the triggering of an air bag or the rollover event are used as an indication of the occurrence of an accident. A conclusion can be drawn with respect to the triggering of an air bag either by way of a monitoring of a crash sensor directly or by way of the reaction of an air bag control



unit. In this sense, a triggering of an air bag is assumed even when signals are detected which lead to a triggering of an air bag.

In the above context, an embodiment is of special interest in the case of which an automatically operable parking position is provided which is also addressed by a control unit and which will be engaged when the vehicle has come to a stop after an air bag triggering operation and/or a rollover event. For indicating and including the vehicle speed, a normally existing vehicle speed sensor can be analyzed. Naturally, the parking position can also be engaged on the basis of other criteria. Furthermore, it is possible to immediately engage the parking position when the positive engagement interrupted because of the air bag triggering operation or the rollover event. In this context, reference is also made to German Patent Document DE 196 25 019 A1 in which, among other things, an automatic activating of the parking position is described. By activating the parking position, a rolling-away is effectively prevented after a stoppage of the vehicle.

According to another preferred embodiment, a transmission selection device is provided which has a defined rest position

and, for selecting a driving position desired by the driver, can be directed out of its rest position into which it will then automatically return. When the positive engagement is interrupted or a shifting into the neutral position takes place on the part of the transmission, the driver will not be confused by different adjustments of the transmission selection device, on the one hand, and of the transmission, on the other hand. Also, no synchronization problems occur as a result of absent detent positions.

Additional embodiments are defined in the subclaims.

Two simple embodiments of the present invention will be explained in detail with respect to the attached drawings.

Figure 1 is a schematic block diagram of a device for increasing the directional control according to the invention;

Figure 2 is a schematic block diagram of a second embodiment of the device according to the invention for increasing the security.

According to Figure 1, an internal-combustion engine 12,

which is coupled directly with a transmission 10, is arranged in a vehicle which is not shown. An output shaft 14 extends from the transmission 10 in the direction of the wheels which are not shown.

The transmission is an automatic range transmission which is shifted by means of an electric transmission control 16. The transmission control 16 receives its input information from a bus 18 (such as a CAN bus). It has an interface which is not described in detail and which is coupled with the bus 18 (reference number 20) and which filters the required information out of the information present on the bus.

In the first embodiment, information concerning rotational wheel speeds  $N_1$  to  $N_4$  is present on the bus 20, which is fed into the bus 18 by corresponding rotational wheel speed sensors 22 to 28. In addition, information concerning the yaw rate  $G$  is present on the bus 20, which yaw rate  $G$  is fed by a yaw sensor 30.

The electric transmission control 16 continuously determines a swerve value from the signals  $N_1$  to  $N_4$  and  $G$  and compares it with this swerve value with a limit value stored in the

transmission control 16. If the swerve value exceeds the defined limit value, the transmission 10 shifts into its neutral position whereby the positive engagement in the transmission line is interrupted.

As an alternative, the signals of other sensors or detection devices which permit a conclusion with respect to a swerving event can naturally also be analyzed.

In certain critical situations in which an interruption of the transmission line is helpful, the driver must therefore no longer manually shift the transmission into the neutral position. On the contrary, this is carried out by the vehicle itself.

An alternative embodiment of the invention is illustrated in Figure 2. In this case, an internal-combustion engine 112 is arranged in a vehicle, which is also not shown. This internal-combustion engine 112 is again directly coupled with a transmission 110. An output shaft 114 extends from the transmission 110 in the direction of the wheels which are not shown.

The transmission 114 is an automatic range transmission

which is shifted by means of an electric transmission control 116. The transmission control 116 receives its input information from a bus 118. The transmission control 116 has an interface which is not described in detail and which is coupled with the bus 118 (reference number 120) and filters the required information out of the information present on the bus.

In a second embodiment, information concerning air bag triggering events, specifically signals  $AN_1$  to  $AN_4$ , are present on the bus 120. These signals are fed by corresponding air bag triggering devices 122 to 128, for example, crash sensors or an air bag control unit, into the bus 118. Furthermore, information concerning a rollover event  $\ddot{U}$  is present on the bus 120, which information is fed by a rollover sensor 130.

The electric transmission control 116 now continuously monitors the existing air bag triggering and rollover signals. When a triggering of an air bag or a rollover event is detected, the transmission 110 shifts such that the positive engagement in it is interrupted. Thus, no more torque is transmitted from the engine 112 to the driving wheels and a continued movement of the vehicle is effectively prevented.

As an alternative, naturally the signals of other sensors or detection devices can also be analyzed, from which a conclusion can then be drawn with respect to a situation in which the positive engagement in the transmission should be interrupted.

In critical situations in which an interruption of the positive engagement in the transmission line or in the transmission is helpful, the driver therefore no longer has to manually shift the transmission into the neutral position. On the contrary, the vehicle itself achieves an interruption of the transmission line and, as a further development, a locking of the wheels.

Since the above-mentioned applications can be implemented by a corresponding modification of the transmission software, a particularly cost-effective implementation is possible.

## CLAIMS:

1. Device for increasing the security of a vehicle having

- an automatic transmission (10, 110) which is acted upon by an electric transmission control (16, 116), and
- having a detection device (22-30, 120-130) for detecting a critical driving situation and generating a corresponding signal,

characterized in that an analyzing device is provided which examines whether the generated signal reaches a certain value or exceeds a certain threshold and which, when the value is reached or the threshold is exceeded, causes the transmission control (16, 116) to interrupt the positive engagement in the transmission.

2. Device according to Claim 1,

characterized in that the detection device is an element of an air bag triggering device (122 to 128), and the positive engagement is interrupted when the triggering of an air bag or a signal leading to the triggering of an air bag is detected.

3. Device according to one of Claims 1 or 2,

characterized in that the air bag triggering device comprises at

least one crash sensor and/or an air bag control device whose signals are used for triggering the air bag.

4. Device according to one of Claims 1 to 3, characterized in that the detection device is a rollover sensor (130), and the positive engagement will be interrupted when a rollover event is detected.

5. Device according to one of Claims 2 to 4, characterized in that an automatic parking position is provided which is activated in the event of an interruption of the positive engagement.

6. Device according to Claim 5, characterized in that a vehicle speed sensor is provided and the automatic parking position will be activated when additionally the vehicle has essentially come to a stop.

7. Device according to Claim 1, characterized in that the detection device is a device for generating a value describing a swerving event, and the positive engagement will be interrupted when the swerving value exceeds a certain threshold value.



8. Device according to Claim 7, characterized in that the transmission control (16, 116) shifts the transmission (10, 110) into the neutral position in the event of an interruption of the positive engagement.

9. Device according to Claim 7 or 8, characterized in that the detection device comprises rotational wheel speed sensors (22 to 28) and/or a yaw rate sensor (30).

10. Device according to one of the preceding claims, characterized in that the analyzing device is integrated in the transmission control (16, 116).

11. Device according to one of the preceding claims, characterized in that a gear selection device is provided which has a defined rest position and, for selecting a driving position desired by the driver, is directed out of its rest position into which it will then automatically return.

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(81) Bestimmungsstaaten: US, europäisches Patent (AT, BE, CH,  
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Veröffentlicht

Mit internationalem Recherchenbericht.

Vor Ablauf der für Änderungen der Ansprüche zugelassenen  
Frist; Veröffentlichung wird wiederholt falls Änderungen  
eintreffen.

(54) Title: DEVICE FOR INCREASING THE SECURITY OF A MOTOR VEHICLE

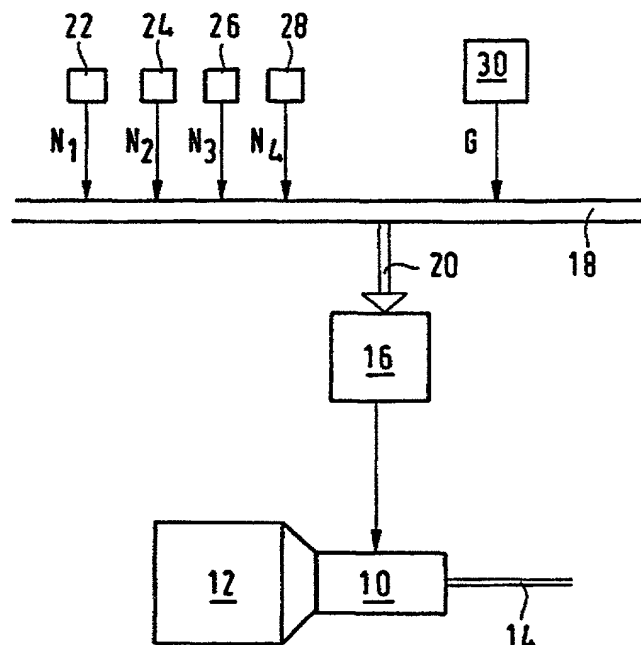
(54) Bezeichnung: VORRICHTUNG ZUR ERHÖHUNG DER SICHERHEIT BEI EINEM FAHRZEUG

(57) Abstract

The invention relates to a device for increasing the security of a motor vehicle comprising an automatic transmission (10), which is impinged upon by an electrical transmission control system (16) and a detection unit (22, 24, 26, 28) for detecting a critical driving situation and for generating a corresponding signal. In order to increase driving security, an evaluation device is provided which checks whether the generated signal has reached a specific value or exceeded a specific threshold. If said value has been reached or the threshold has been exceeded, the evaluation device causes the transmission control system (16) to interrupt the positive engagement of the transmission (10).

(57) Zusammenfassung

Die Erfindung betrifft eine Vorrichtung zur Erhöhung der Sicherheit bei einem Fahrzeug mit einem automatischen Getriebe (10), das von einer elektrischen Getriebesteuerung (16) beaufschlagt wird, und mit einer Detektionseinrichtung (22, 24, 26, 28) zur Erfassung einer kritischen Fahrsituation und Erzeugung eines entsprechenden Signals. Zur Erhöhung der Fahrsicherheit ist es vorgesehen, dass eine Auswertevorrichtung vorgesehen ist, die überprüft, ob das erzeugte Signal einen bestimmten Wert erreicht oder eine bestimmte Schwelle überschreitet und die die Getriebesteuerung (16) bei Erreichen des Wertes oder Überschreiten der Schwelle veranlasst, den Kraftschluss im Getriebe (10) zu unterbrechen.



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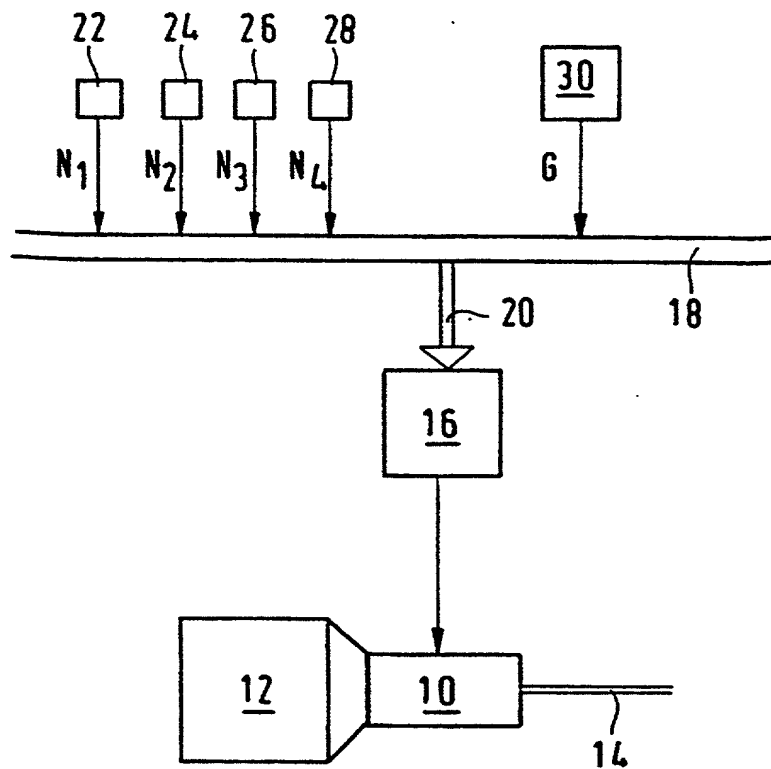


FIG.1

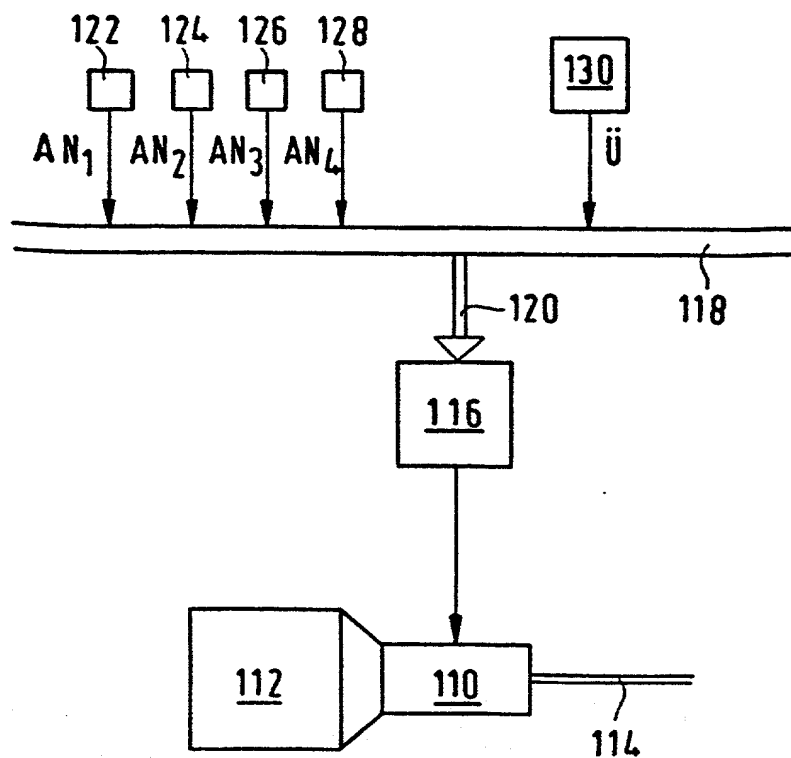


FIG.2

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY  
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ATTORNEY'S DOCKET NUMBER

951/50010

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**DEVICE AND METHOD FOR INCREASING THE SECURITY OF A VEHICLE**

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No. \_\_\_\_\_

on \_\_\_\_\_

and was amended

on \_\_\_\_\_ (if applicable).

☒ was filed as PCT international application

Number PCT/EP00/01766

on 1 March 2000

and was amended under PCT Article 19

on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations. §1.56(a).

I hereby claim foreign priority benefits under Title 35, United State Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT indicate PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
Germany	199 12 331.4	19 March 1999	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Germany	199 12 332.2	19 March 1999	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

Combined Declaration For Patent Application and Power of Attorney (Continued) (includes Reference to PCT international Applications)				ATTORNEY'S DOCKET NUMBER <b>951/50010</b>	
I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national of PCT international filing date of this application:					
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U.S. APPLICATIONS			STATUS (Check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE		PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.					
PCT APPLICATION NO	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (IF ANY)			
<p>POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)</p> <p style="margin-left: 40px;"> <i>6</i> Herbert I. Cantor, Reg. No. <u>24,392</u>; James F. McKeown, Reg. No. <u>25,406</u>; Donald D. Evenson, Reg. No. <u>26,160</u>; Joseph D. Evans, Reg. No. <u>26,269</u>; Gary R. Edwards, Reg. No. <u>31,824</u>; and Jeffrey D. Sanok, Reg. No. <u>32,169</u> </p>					
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	RESIDENCE & CITIZENSHIP	CITY <b>Raubling</b> <i>Duf</i>	STATE OR FOREIGN COUNTRY <b>Germany</b>		COUNTRY OF CITIZENSHIP <b>Germany</b>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <b>St. Nikolausstr. 3</b>	CITY <b>Raubling</b>		STATE & ZIP CODE/COUNTRY <b>D-83064, Germany</b>
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME		SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY		COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY		STATE & ZIP CODE/COUNTRY
<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.</p>					
SIGNATURE OF INVENTOR 201 <i>Rudolf Ehrmaier</i>		SIGNATURE OF INVENTOR 202 <i>Josef Neuner</i>		SIGNATURE OF INVENTOR 203	
DATE <b>17.09.01</b>		Date <b>17.09.01</b>		DATE	